



Remarks

The amendments

Claim 17 as amended now sets forth that the element that expands is *located between the mold and the tubes* (line 6). In one species of the invention, the element that expands is the silicon in a captured silicon mold; this species is shown at 607 in FIG. 6; in another species, the element that expands is a layer of expanding foam in the lay-up for the lug; this is shown at 705 in FIG. 7. The process of making lugs is described beginning at page 6, line 1 of the Specification. The claims as amended are thus fully supported by the Specification as filed.

Patentability of the claims as amended over Trimble

What Trimble discloses

Trimble's disclosure is well-summarized by his *Abstract*:

A method of molding generally hollow components and assemblies for a bicycle frame including molded composite materials, such as unidirectional structural fibers impregnated with a heat curable synthetic resin. Opposing parts of at least two adjacent wall sections are overlapped to form a shell and the overlapped parts are compressed together between an external mold and an internal pressing member, such as an inflatable bladder. The shell is then cured while under compression to provide a pressure molded juncture integrally uniting the wall sections and forming a generally hollow bicycle frame component.

As is clear from the *Abstract* and Trimble's FIG. 1, Trimble uses his mold to make *an entire bicycle frame*, not to assemble a frame out of preexisting tubes. Trimble's frame is made by placing pieces of composite material in the top and bottom halves of the mold of FIG. 1, closing the mold, and using bladder 60 to force the pieces of composite material against the walls of the heated mold. The frame as it comes out of the mold is a single piece, not tubes held together by lugs. Indeed, as Trimble points out at col. 25, lines 17-19,

The integral one-piece design preferred eliminates the problems of joint failure commonly experienced by conventional frame assemblies.

It should further be pointed out here that Trimble's techniques cannot be used to make laid-up lugs in a conventional frame assembly, since the bladder would be inside the tubes and could only exert pressure on the tube walls, not on the lugs.

Applicant's frames and lugs

Applicant's frames are made of tubes connected by lugs, and are therefore what Trimble terms "conventional frame assemblies". In Applicants' case, however, the tubes are carbon fiber tubes and the lugs are made by laying up layers of pre-impregnated carbon fiber fabric around the joints of the tubes. Problems with conventional frame assemblies made using carbon fiber tubes and laid-up lugs have included weakness due to voids in the resin in the lugs and poor appearance of the lugs. In Applicant's frames, these problems are solved by the lug-making techniques shown in FIGs. 6 and 7 and described beginning at page 6, line 1 of Applicant's Specification. Central to these techniques is the use of a mold together with an expanding element to cure the lugs. After the lugs have been laid up, the mold is placed around the lugs and the tubes and heated to cure the lugs. When the mold is heated, an expanding element that is located between the mold and the tubes that are joined by the lug expands. The expanding element may either be silicon in a captured-silicon mold or expanding foam that is included in the lay-up. In both cases, when the element expands, the lay-up is forced against the tubes; in the case of the silicon, the silicon expands against the surface of the lug; in the case of the expanding foam, the expanding foam forces the lay-up against both the tubes and the surface of the mold and itself becomes an integral part of the lug. The result in both cases is the elimination of voids in the lug and a neat appearance of the lug.

Distinctions between Trimble's techniques and Applicant's techniques

For present purposes, the distinction between Trimble's techniques and Applicant's techniques can be summed up like this: in Trimble, there are no tubes for the expansion element (the bladder) to work against; instead, the expansion element is *inside* the pieces of composite material from which the frame is made and *makes* the tubular elements of the frame by forcing the pieces of composite material against the mold. In Applicants' techniques, there are tubes that are connected by lugs made of composite material; the

expansion element is *between* the mold and the tubes and makes the lug by expanding against the tubes and the mold.

The distinctions in Applicant's claims

As now amended, Applicant's claim 17 reads as follows:

17. A method of making lugs for joints in a bicycle frame made of carbon fiber tubes,
the method comprising the steps of:
 making a lay-up of at least carbon fibers and a matrix material around the joint,
 applying a mold to the tubes and laid-up fibers and matrix material,
and
 curing the lug in the mold, the cure including expansion of an element located between the mold and the tubes.

The claim clearly sets forth that Applicant's method is for "making lugs for joints in a bicycle frame made of carbon fiber tubes", not for making a frame having "an integral one-piece design" like those of Trimble; further, the claim clearly sets forth that the element that expands is "located between the mold and the tubes". As noted above, Trimble's mold makes a one-piece frame, not a conventional frame constructed of tubes and lugs, and as one would expect from that fact, Trimble does not disclose an expansion element that is "located between the mold and the tubes". Because Trimble does not disclose all of the limitations of claim 17 as now amended, the amendment overcomes the rejection under 35 U.S.C. 102 and the claim is patentable over the reference.

Since claim 17 is patentable, so are all of the claims that are dependent therefrom; further, because claim 17 is generic to claim 18, the amendments to claims 17 and 18 have further overcome the restriction requirement made by Examiner with regard to claim 18.

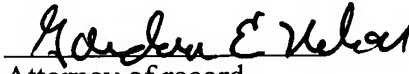
The dependent claims are also patentable in their own rights over Trimble; Trimble's mold is not a captured silicon mold, as required by claim 18. Trimble does not disclose including a layer of expanding foam in his lay-up, as required by claim 19; claims 20-23

set forth details of making lay-ups for lugs; as set forth above, Trimble's frame does not have lugs and the reference consequently discloses nothing whatever about making lugs on bicycle frames.

Conclusion

Applicant has amended claims 17-19 to overcome the rejection under the Trimble reference and has shown how the remaining claims are not only patentable because they are dependent from patentable claims, but are patentable in their own rights over the reference. The amendments to the claims are fully supported by the application as filed. Applicants have been fully responsive to Examiner's Office action of 4/29/05 as required by 37 C.F.R. 1.111(b) and respectfully request that Examiner continue with his examination, as provided by 37 C.F.R. 1.111(a). No fees are believed to be required by way of this response. Should any be, please charge them to deposit account number 501315.

Respectfully submitted,


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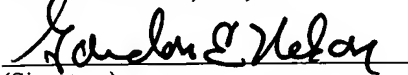
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